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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/568,341	02/14/2006	Masahiko Kubota	03500.518807.	3333

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EXAMINER	
RAYMOND, BRITTANY L	
ART UNIT	PAPER NUMBER
1722	
MAIL DATE	DELIVERY MODE
12/22/2010	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/568,341	KUBOTA ET AL.	
	Examiner	Art Unit	
	BRITTANY RAYMOND	1722	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 November 2010*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *4,5,9 and 16* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *4,5,9 and 16* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *14 February 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Double Patenting

1. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

2. Claims 4, 5, 9 and 16 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-6, 9 and 10 of U.S. Patent No. 6951380 in view of Ohkuma (U.S. Patent 6461798). Although the conflicting claims are not identical, they are not patentably distinct from each other because both inventions teach forming a first positive resist of a first material and sensitive to a first radiation on a substrate, forming a second positive resist of a second material and sensitive to a second radiation on the first resist, exposing the second resist to a second radiation, developing the second resist, exposing the first resist to a first radiation, and developing the first resist to form a mold pattern. Both inventions also teach forming a

resin over the mold pattern, and removing the mold pattern to form a liquid discharge head. Since the materials of the first and second resists are flipped in U.S. Patent 6951380, the reference, Ohkuma, is combined to teach that a polymethyl isopropenyl ketone can be used as a first photoresist in an ink jet head manufacturing process.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 4, 5, 9 and 16 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The recitation of, "not less than 15 μm" in claims 4 and 5 is equivalent to 15 μm or more. The specification only teaches examples with thicknesses of either 15 or 20 μm, but does not teach that the thickness can be greater than that amount.

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 4, 5, 9 and 16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claims 4 and 5, the recitation of "not less than 15 μm" is indefinite because the range is open-ended.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

8. Claims 4, 5, 9 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kubota (U.S. Patent Publication 2004/0070643) in view of Ohkuma (U.S. Patent 6461798).

Regarding claims 4 and 5, Kubota discloses a process of forming a structure comprising: coating a substrate with a first positive resist layer, baking the first positive resist layer, coating the first positive resist layer with a second positive resist layer comprising polymethyl isopropenyl ketone, baking the second positive resist layer, exposing the second resist to a second wavelength of light, developing the second resist, exposing the first resist to a first wavelength of light, and developing the first

resist to form a convex pattern on the substrate (Paragraphs 0058-0063 and Figures 1A-1F). The process could easily be carried out by reversing the materials of the first and second resist by reversing the wavelength of light used for the first and second exposures. Kubota also discloses that the first resist layer can comprise a methacrylic copolymer composite including methacrylic acid, which has 2 to 30% methacrylic acid and a molecular weight of 5,000-50,000 (Paragraph 0053). It is inherent that an anhydride is formed by simply removing water from a chemical compound, often an acid. As to claims 4 and 5, Kubota teaches that after patterning the first and second resist layers, the patterned resists act as a mold, a resin is coated over the mold material, and then the mold material is dissolved and removed to form an ink channel (Paragraph 0050). Regarding claims 9 and 16, Kubota teaches that the polymethyl isopropenyl ketone resist layer is sensitive to light with a wavelength in the range of 260 nm to 330 nm and that the methacrylic copolymer resist layer is sensitive to light with a wavelength in the range of 210 nm to 330 nm (Paragraph 0051). Kubota also teaches that each layer of photoresist can be 10 microns thick (Paragraphs 0104 and 0105), as recited in claims 4 and 5 of the present invention.

Kubota fails to disclose that the polymethyl isopropenyl ketone resist is the first resist and that the methacrylic copolymer resist is the second resist, and that the polymethyl isopropenyl ketone resist layer is not less than 15 microns thick.

Ohkuma discloses a process for the production of an ink jet head comprising: forming energy generating elements on a substrate, forming a photosensitive resin layer on the substrate, patterning the photosensitive resin layer through a patterning mask,

forming a coating resin layer on the patterned photosensitive resin layer, and removing the photosensitive resin layer to form the ink passageway (Col. 7, Lines 28-30 & 62-66; Col. 10, Line 51-Col. 11, Line 30). Ohkuma also discloses that the photosensitive resin layer can comprise polymethyl isopropenyl ketone and that the coating resin layer can comprise an acrylic resin (Col. 8, Lines 11-61 & Col. 11, Lines 20-30), as recited in claims 4 and 5 of the present invention. In example 3, the thickness of the resultant ink pathway-forming pattern, which is equivalent to the portion of the ink jet pattern formed by the lower layer of Kubota, is 15 microns, as recited in claims 4 and 5 of the present invention.

It would have been obvious to one of ordinary skill in the art, at the time of invention by applicant, to have used the polymethyl isopropenyl ketone resist as the first resist in the process of Kubota, as suggested by Ohkuma, because Ohkuma teaches that this allows for an ink pathway to be efficiently formed with no deformation.

Response to Arguments

9. Applicant's arguments filed 10/29/2010 have been fully considered but they are not persuasive.

Applicants argue that Ohkuma does not suggest that there is any benefit in reversing the arrangement of layers in Kubota. Additionally, Applicants argue that the mold for the flow path is formed from a single layer of PMIPK rather than a combination of PMIPK and PMMA. Ohkuma teaches that using the PMIPK resist to form a mold for an ink pathway is an efficient process for forming a highly precise ink pathway at a high yield. Since Kubota requires the use of two resist layers in order to form a more

intricate pattern with stepped features, it would have been obvious to one of ordinary skill in the art, to have used the PMIPK layer as the first layer because as shown in Kubota, the first resist layer forms the majority of the area of the mold. This would then result in at least the majority of the ink pathway being formed highly precisely. Also, Kubota already teaches that the PMMA and PMIPK layers can be used together to form the ink jet head so it would have been obvious to one of ordinary skill in the art that the layers would work with one another if the order of the layers was reversed. One of ordinary skill in the art would simply be able to adjust the exposures based on the wavelengths that each resist is sensitive to.

Applicants also argue that neither Kubota nor Ohkuma teach that the arrangement of the layers as claimed could lead to the superior results shown in the data of the present application. While both Kubota and Ohkuma teach that using PMMA and PMIPK layers to form ink jet heads results in an accurate device, Ohkuma discloses that the PMIPK layer forms a highly precise device. Therefore, if a more intricate passageway were to be formed that would require the use of two resist layers, as in Kubota, one of ordinary skill would look to the teachings of Ohkuma and want to at least try using the PMIPK as the first layer because the first layer forms the majority of the area of the ink passageway. This would then lead to a more precise ink passageway to be formed.

The obviousness double patenting rejection still stands for the same reasons as discussed above.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to BRITTANY RAYMOND whose telephone number is (571)272-6545. The examiner can normally be reached on Monday through Friday, 9:00 a.m. - 5:30 p.m. EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cynthia Kelly can be reached on 571-272-1526. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Kathleen Duda/
Primary Examiner, Art Unit 1722

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